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The Veterinary Care of Domesticated Elephants in Laos by a Mobile Veterinary Unit

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Introduction

Once a commonly occurring species, it is now estimated that only 1200 elephants remain in Laos, compared to tens of thousands at the beginning of the 1900's (Chadwick 1991). Of this about 480 or 40% are domesticated (Maurer & Duffillot 2009).

The legal status of elephants in Lao is dependent on the elephant's classification as "wild" or "domestic". Domesticated elephants are viewed as livestock and are managed by the national Department of Livestock and Fisheries. Wild elephant -management is undertaken by the Department of Wildlife and Forestry. The Lao PDR became signatory to the CITES convention in 2004, therefore trade and international sale of this globally endangered species is subject to regulation. The government of Laos banned the capture of elephants from the wild for domestication in the late 1970s.

Domesticated elephants in Lao PDR are mainly employed in the logging industry in the north, and tourism in the south (Maurer & Duffillot 2009). The traditional use of elephants for transportation still occurs in small remote villages providing employment for immature and unemployed logging elephants. Elephants tend to be used only in areas where the terrain is steep and roads are few, creating access problems. The development of logging industry for the last 30 years created a new opportunity for elephant owners who were used to use them for local transportation. This has led to an intensification of workload, which can threaten an elephant's health.

Tourism is a growing industry in Laos, with 1.7 million visitors in 2008, up from 500,000 a decade ago (LNTA, 2009). Though new camps are established each year, elephant trekking is still in its infancy. For the moment no more tourism activities are available, but a sanctuary, sponsored by ElefantAsia, is about to see the light. Employment opportunities in tourism for domesticated elephants are currently low but could become significant in the future. Currently some elephants are employed in both logging and tourism.

Several ethnic groups such as the *Tai Leu* tribe in northern Laos and the *Kui* tribe in southern Laos possess traditional knowledge of elephant care and breeding. However as the image of a mahout is not highly regarded by younger generations, widespread loss of knowledge regarding traditional medicine and elephant care has occurred.

To rectify this situation, ElefantAsia, an International Non Government Organisation (www.elefantasia.org) working for the protection and conservation of Asian elephants in the Lao PDR, initiated a domesticated elephant conservation project in 2002. Consultations with mahout regarding their socio-economic needs showed they were interested in improving the health of their elephants and increasing their knowledge regarding veterinary medicines. , This led to the initiation of the country's first Mobile Veterinary Unit (MVU) in 2006.

Materials and methods

The MVU is based on a model used at the Lampang Elephant Sanctuary in Thailand. Information on traditional elephant care and knowledge was translated from Thailand and elephant medical needs recommended from Fowler & Mikota (2006) and Evans (1910). The MVU is an all-terrain vehicle, fully fitted

and equipped with veterinary medication. It is based in Sayaboury Province, in the north-west of Lao PDR, which contains approximately 80% of the domesticated elephants in Laos (Maurer & Duffillot 2009). Though most field missions occurred in Sayaboury, the provinces of Champassak, Saravane, Luang Prabang, Oudomxay and Vientiane were also visited.

The MVU team consisted of one Lao government official from the relevant province and officials from the specific district visited. Officials were responsible for planning each mission and informing mahouts of the MVU's intended visit. ElefantAsia employed a multi-lingual mahout liaison officer to gauge the needs and requirements of mahouts, and to act as a translator between officials, mahouts and any foreign veterinarians joining the mission. Free elephant care training and first aid kits were given to mahouts. The mahout liaison officer trained mahouts in the proper administration and application of supplies, with all instructions listed in a free booklet written in the Lao language. At the beginning of 2008, a short study on the digestive parasites was undertaken using faecal samples collected during field missions and analysed by microscope after sedimentation.

Proactive annual missions were organized to different villages and districts at prearranged meetings. Reactive emergency missions were initiated when needed. All medical treatment and supplies were given for free, but to install a sense of ownership mahouts must purchase their own drugs for use when the MVU is not present. Most mahouts/owners can afford veterinary expenses. An adult domesticated elephant is worth approxiamately 10,625 and can earn up to 1667 for two months work in the logging industry (Labatut 2009a). A two-day course of antibiotics for an average elephanst costs approximately 7, with owners recommended to buy 10 rounds of antibiotics if long-term therapy is required. While these can be considered expensive purchases in a least-developed nation, the MVU shows elephant owners that the price of medicine is relatively small when compared to the animal's value.

Data on elephants was collected between December 2007 and July 2009 from field mission medical reports detailing all medical problems observed and treated. Domesticated elephants were registered using a standardised registration form which contains a unique elephant registration number and documents details including the elephant's name, sex, origin, weight, gait and any medical history and care received. The deaths or births of elephants were generally recorded during the field missions by interviewing the mahout, or officials informed MVU staff of these events. All the registration data were entered into a national domesticated elephant database, including information regarding the elephant's owner, mahout and location.

Results and discussion

Details of treated elephants

From the period December 2007 to July 2009 medical care was administered to 347 individual domesticated elephants, 55% female, 45% male. Employment varied with 78% working in the logging industry, 10% in tourism and 12% undertaking village work or unemployed at the time of treatment.

Mortality

Deaths vastly outweigh births, with approximately one birth recorded for every 10 deaths. From January 2009 – July 2009, 10 domesticated elephant deaths were recorded in the Sayaboury Province. Causes given for these deaths included tusk fractures, diarrhoea, overworking, old age, poaching and septicaemia. The reasons given for an elephant's death were unreliable as post-mortems rarely occur and mahouts fear repercussions for the occurrence of possibly preventable deaths. Additionally, the death of a domesticated elephant was previously only notified to the Department of Livestock and Fisheries when annual livestock taxes were due, making disease diagnosis impossible. However the notification of deaths is slowly being reported more frequently.

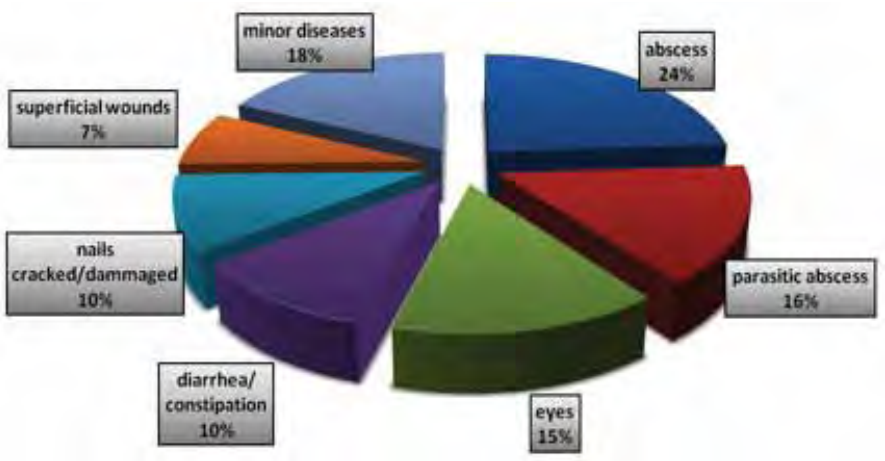


Figure 1. Commonly-occurring disorders of domesticated elephants.

Diseases and their treatment

Figure 1 indicates the most commonly occurring disorders observed. Figure 2 is a breakdown of the less frequently found disorders. Percentages are calculated from a total of 315 elephants with 422 medical conditions recorded and analysed.

Disorders such as abcesses were caused by the prolonged chaffing of chains. Superficial wounds, and eye problems due to chronic irritation are associated with work in the logging industry due to the harsh contidtions of logging work and contiuned exposure to dusty environments.

Given geographical and infrastructure constraints, surgery or minor operations were not possible. The only big pathological conditions which could be successfully treated and cured onsite were the treatement of severe abcesses. Veterinarins with the MVU could open abscesses with a scalpel but this was done only if the mahout agreed to allow the elephant to rest and not work for several days after the procedure. The abscess wound was cleaned and flushed with 1% povidone iodine (betadine) as an antispectic solution. Once clean an antibiotic spray containing oxytetracyclin was applied. Oxyblue Spray was ususallly used for this purpose. Negasunt (Table 1), an insecticidal powder was also applied to protect the open wound from flies. Intra muscular broad-spectrum antibiotics such as penicillin-streptomycin (20/20) 50 ml per elephant was provided to animals which have an abscess greater than 10 cm. The freshness, consistency and location on the body of the abcsess was also a consideration for antibiotic use.

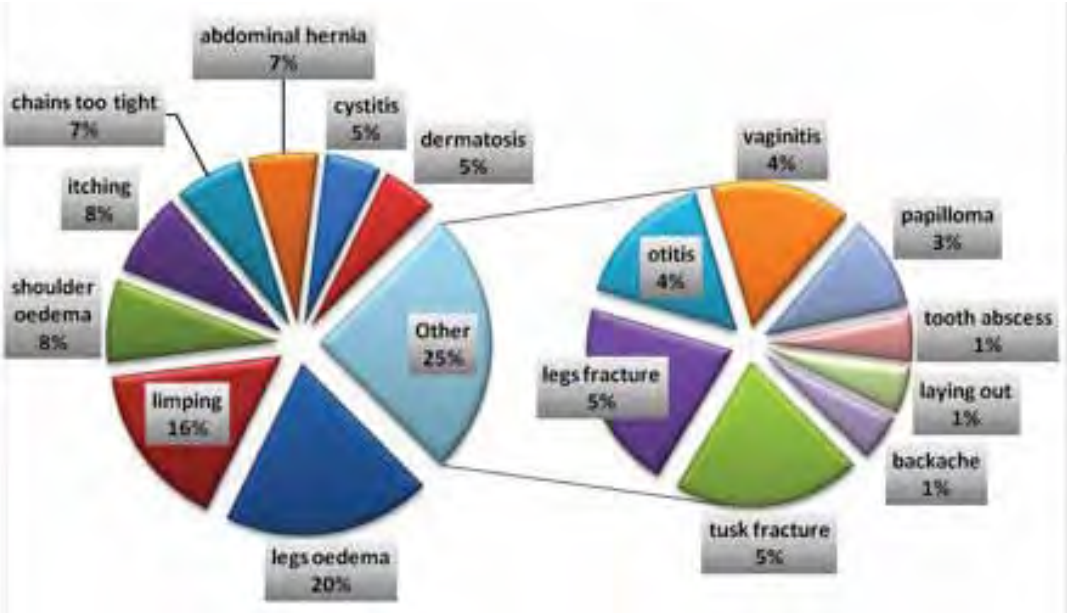


Figure 2. Less common disorders.

Table 1. Commonly used drugs in the MVU.

Drugs	Dosage	Treatment intervals
Betadine	Diluted 70 %	Twice a day
Oxytetracycline	20 mg/kg IM	48 hours
Negasunt	Cover the wounds	Twice a day minimum
Penicillin-streptomycin	4-2 IU/kg IM	24 hours
Mebendazol	3 mg/kg PO	6 months to 1 year
Dufamec	0.07 mg/kg SC	6 months to 1 year
Opsar	2 ml per eye	Twice a day
Archifen	0.5 ml per eye	Twice a day

The duration of a course of antibiotics for treating an abcess was dependant on the size and age of the abscess. Vitamin therapy (ADE, B12, B4,) was occasionally administered in the instances of weightloss or marked apathy in the elephant. Recovery was determined on whether post-treatment advice was adhered to by the mahout.

Eye discharge was common (15% of all cases treated) due to the extremedust conditions. Eye discharge only became a cause for concern when the eye discharge changed colour, consistency or frequency. A low to moderate eye discharge was common in 90% of all domesticated elephants observed in Laos. Eye problems observed in domesticated elephants could be seperated into two catagories: Chronic diseases such as cataracts, corneal opacity, blindness, and acute diseases associated with red eyes and continual running fluid. An eye flush with physiological fluid such as Opsar was advised when running eye fluid was moderate. In the cases of red eyes or signs of eye infections an antibiotic eyedrop containing chloramphenical like Archifen was applied. Without proper diagnostic tools available in the Lao PDR, the use of eyedrops containing corticoids was not possible.

Disgestive disorders such as diarrhoea and constipation accounted for 10% of cases observed. These were observed more frequently in elephants living in southern Laos where the weather is drier and sources of clean drinking water fewer.

Instances of foot diseases in domesticated elephants were minor (10% of cases) when compared to those of captive elephants in zoos (Culti *et al.* 2001). In most cases no pain or discomfort was shown by the elephant. Foot infections occured mainly from working accidents, UXO (unexploded ordinance), or damage from foreign objects. In severe cases treatment and care for these problems was often very prolonged as no artifical support such as plaster casts are available in Laos. Unfortunately this means any elephant that cannot physically support itself is destined to die.

Foot care treatment in Laos was very simple and worked on the "maximum restraint" technique. Mahouts were advised to put their elephant in an area of the forest where there was sufficient food and water within a very small spatial area. Two baths per day were also advised to prevent imflammation, after which an analgesic balm such as Counterpain should be applied in the instance of a fracture or chronic limping.

Other diseases observed infrequently included dermatitis and genital infections. Dermatitis was generally treated by improving skin health. The best remedies in the Lao PDR for this was to ensure the elephant had an increased number of baths, were dewormed and disinfected on a regular basis. Diagnosis of dermatalogical etiology was not currently possible in the Lao PDR. Genital disorders were diagnosed by changes in the colour and smell of urine. Usually problems observed were at a chronic stage. Urinary infections were treated with antiboitics such as enrofloxacin with courses reccommended for at least 15 days.

Endo and ecto parasites were the second most common disorders and were also common in Sumatra (Stremme *et al.* 2007). Digestives strongles were the most common parasite in Laos (Fig. 3). A good deworming programme could decrease parasites by nearly 95% after using drugs. For the MVU, two drugs were used: Mebendazol (3 mg/kg) for elephants without symptoms of externals parasitises and Dufamec

1% (0.07 mg/kg) for elephants showing external symptoms. The ventral oedema, a typical sign of strongles, is rare.

Dufamec was successful in treating external parasitises. However it is an irritant and can cause numerous abscesses at the site of injection. This can unfortunately make mahouts distrustful about modern medicine. For this reason, Mebendazol was used 84 % of the time.

Complaints from mahouts were more commonly occurring in districts where elephant breeding was a new activity or mahouts were young and professionally inexperienced. These mahouts did not posses a strong knowledge of elephant sanitary requirments or the detrimental impacts of overworking elephants. . Domesticated elephants in logging camps were often observed in very poor conditions with chronic and long-lasting medical conditions. These districts also possess higher indicences of inexperienced mahouts being killed by their elephants.

Musth

Incidences of uncontrolled musth have increased due to the decline in traditional knowledge and musth management. The musth starts normally when the elephants have 20 or 25 years old and occurred once or twice a year (Labatut 2009a). The MVU observed that some elephants are still working rather than being seperated and isolated in remote areas as recommended in Gale (1966). Since the implementation of this study, five emergency visits were undertaken to logging camps to tranquelize uncontrolable bulls and in 2008 one bull in musth was shot and killed by his mahout to prevent personal injury.

The developing role of the MVU

The MVU plays an essential role in supplying much-needed veterinary treatment to domesticated elephants. Visiting 73% of the population, the MVU reaches a high percentage of domesticated elephants, owners and mahouts. However, there are a number of factors that limits elephant veterinary work in Laos.

In 2010 a veterinary curriculum is beginning in the Lao PDR, but is still very basic. The majority of the 80 Lao national veterinarians were trained decades ago. The country lacks laboratories capable of detecting major infectious diseases such as EEHV, pox fever or turberculosis. Only three labarotories have begun to cultivate human turberculosis diagnonsis,. A a result veterinary treatment is reliant on symptomatic observations rather than etoligical diagnosis. The MVU has no labaratory equipment to perform pathology. This also limits treatment of digestive disorders so after animals are dewormed, traditional dietary changes are given such as feeding sticky rice, coconut leaves and tamarind for diarrhoea. If still persisting, antibiotics such as oxytetracyclin are reommneded for a period of five days. Constipation in domesticated elephants is treated by feeding Chinese watermelons or palm leaves.

The remoteness of logging camps makes access to certain areas difficult. Acquiring medical supplies in such areas is also difficult and most drugs used are imported from Thailand directly

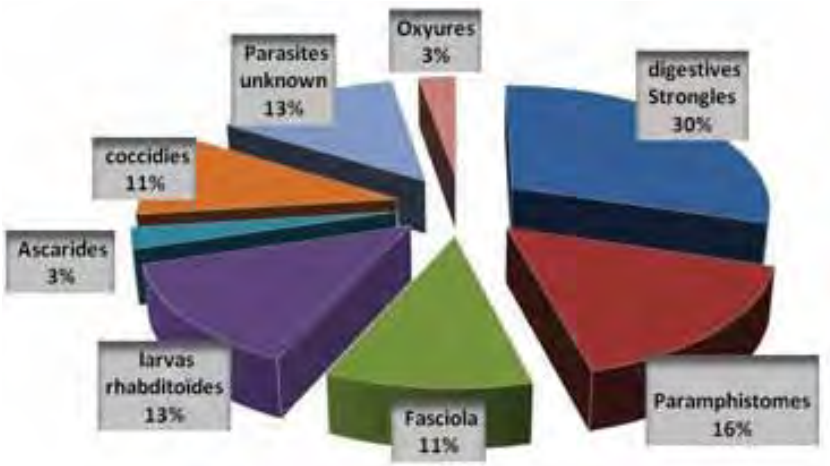


Figure 3. Digestive parasites recorded in a study of 13 elephants in 2008.

to ElefantAsia headquarters in Vientiane. As rural areas do not carry most medicines required for elephant healthcare and there is a risk of spillage when medical supplies are transported by MVU. It would be greatly assisted if medicines were readily available at provincial or district pharmacies.

As it is the elephant owners and mahouts that care for domesticated elephants on a daily basis, and post-treatment rehabiliation is reliant on the mahout, it is essential that they are provided with basic medical and product training. Local education about the animal's conservation status and the need for reproduction is also critical if the elephant population is to recover. To improve veterinary skills, a short educational booklet witten in Lao has being distributed. This gives practical information regarding elephant care, product use and dosage rates. The Elephant Care Manual (2005) from Thailand will also be translated and given free to all elephant owners, mahouts and tourist camps working with domesticated elephants.

Currently domesticated elephants in Laos are not vaccinated against preventable diseases. This is due to a fear amongst mahouts about vaccines, and a lack of understanding about the need for preventative medicine. One of the MVU's current projects is to provide mahouts with a clear understanding of preventative medicine techniques and benefits. Once mahouts and elephant owners are educated, a vaccine program can be implemented within field missions.

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